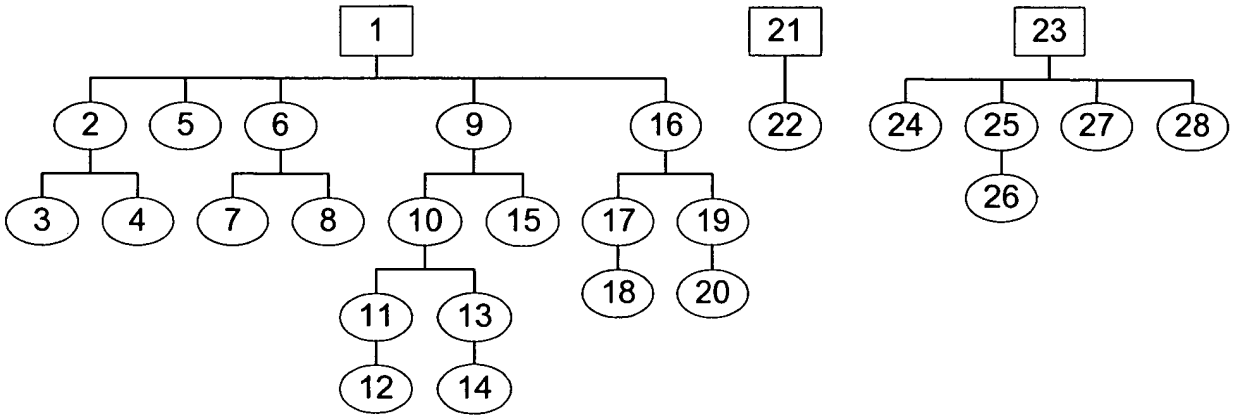
REMARKS

Claims 1-28 are pending in this application. Currently no claims stand allowed. The diagram below illustrates the relationships among the various claims. Claims 1, 21, and 23 are in independent form.



The Office Action rejects claims 1, 2, 4-6, 7, 9, 10, 15-18, 21, and 23-28. Claims 1, 2, 4, 6, 7, 9, 10, 15-18, 21, 23, and 25-28 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent 5,621,662 to Humphries et al. (*Humphries*) in view of U.S. Patent 6,185,611 to Waldo et al. (*Waldo*). Dependent claims 5 and 24 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over *Humphries* in view of *Waldo* and further in view of U.S. Patent 6,269,378 to Quirt (*Quirt*). Finally, the Office Action objects to dependent claims 3, 8, 11-14, 19, 20, and 22 as being dependent on base claims rejected by the Office Action.

The Office Action objects to the drawings as failing to comply with 37 C.F.R. § 1.84(p)(5). The submitted amendments to pages 12, 13, and 17 of the detailed description section of the specification correct typographical errors that led to the objections to the drawings. Figure 5 itself contains the correct reference signs "504" and "506". The submitted amendments to page 2 of the detailed description provide corrections to information pertaining to HomePNA

and X10.

The Office Action asserts that independent claims 1, 21, and 23, along with claims depending from these independent claims, are obvious over *Humphries* in view of *Waldo*. *Humphries* teaches a networked home automation system, while *Waldo* teaches a lookup service for a distributed system that permits automatic addition and deletion of network services. However, neither of these references, whether considered separately or in combination, teaches an element common to the three independent claims in this application: **"a soft-state store to manage at least periodic refresh information for the plurality of devices and the plurality of device objects, the refresh information managed by the soft-state store as a plurality of soft-state variables"** (pp. 32 and 36-37). Contrary to the assumption made in the Office Action, the claimed soft-state store is **NOT** disclosed as or suggested by either the "directory" of *Humphries* or the "Java space" of *Waldo*.

Humphries describes a home automation system and features an error-checking routine initiated by a controller or host computer. The host computer periodically transmits a message to each node on the network. Each node responds by transmitting an acknowledgement message back to the host computer. By comparing the responses to a **directory** containing a list of all nodes that should be connected to the network, the host computer detects whether any node has become disconnected from the network. *Humphries*, col. 4, ll. 51-28; col. 9, ll. 34-35. This directory in *Humphries* is not applicants' soft space store described in the specification and recited in the claims.

The one or more "Java spaces" of *Waldo* are object repositories used by programs to persistently store software objects and to make such objects accessible to devices within a distributed system. *Waldo*, col. 6, ll. 9-21. Again, these Java spaces are not applicants' soft

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space store described in the specification and recited in the claims.

In applicants' specification, a distributed, networked system is composed of several physically separate subsystems communicating by means of a network. Each subsystem has its own local state information, which in the simplest case includes whether that subsystem is currently connected to the network. The global system in turn has a global state, which comprises the local states of its constituent subsystems.

There are two approaches to determining the global state of the system: the soft state approach and the hard state approach. In the soft state approach, the various subsystems transmit refresh messages at periodic intervals to one or more receivers within the global system. In general, as in the embodiments described in applicants' specification (pp. 18-19), each subsystem will have a message refresh interval appropriate to its function within the system. As noted in the specification (p. 3), a refresh message can also be called a "heartbeat". A refresh message sent by a particular subsystem constitutes local state information for that subsystem. In the simplest case, a refresh message signals that the subsystem is still online and has not become disconnected. A receiver of these refresh messages, which might be the central system, stores each subsystem's message, which will either automatically time out (be deleted) after a certain time interval or will be replaced by a new refresh message from that subsystem. At any point in time, the set of stored or timed-out refresh messages for the subsystems serves as an estimate or approximation of the true current global state of the system. Because it is only an approximation, the global state information is said to be "soft".

By contrast, under the hard state approach, the system determines its global state at a particular point in time by sending out messages to each of its component subsystems at that moment and collecting any acknowledgement messages received in response. In the soft state

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approach, the subsystems have an active role in periodically sending their refresh messages, and the receiver of the refresh messages has a passive monitoring role. Under the hard state approach, however, the central system plays the active role by polling its subsystems. *See* Suchitra Raman and Steven McCanne, *A Model, Analysis, and Protocol Framework for Soft State-based Communication*, 1999 ACM SIGCOMM 15 (copy submitted with Applicants' Information Disclosure Statement and considered by Examiner Barnes on Feb. 28, 2003); Puneet Sharma et al., *Scalable Timers for Soft State Protocols*, 1997 IEEE INFOCOM 222 (copy enclosed with the Supplementary Information Disclosure Statement accompanying this response).

As applicants understand its teachings, the error-checking routine of *Humphries* involves a hard state design, the opposite of the soft state approach. In *Humphries*, the central controller initiates a poll of its component devices, and global state information is determined on the basis of the acknowledgement messages received from the components in response to the polling inquiries. By contrast, in accordance with applicants' claims, global state is estimated from the periodically updated flow of refresh messages initiated by subsystems and recorded in the soft state store claimed in independent claims 1, 21, and 23.

Applicants are not clear why the Office Action considers the "Java space" of *Waldo* to be related to the soft state store of the claims. Though both are intended for use in distributed systems, **they are entirely different in structure and function**. As described in *Waldo*, a Java space is a kind of database that provides persistent storage of software class objects within a distributed system, facilitating exchange of such objects among clients of the Java space in a manner similar to a network file server. The soft state store claimed by applicants is not a database server or a file server and does not resemble such devices. Rather, it is a mechanism for

recording and updating refresh messages received from network subsystems so that the approximate global state of the system can always be known.

Independent claims 1, 21, and 23 are patentable over *Humphries* in view of *Waldo* because those references do not teach or suggest the soft state store claimed by applicants. Applicants' dependent claims are allowable for at least the same reason. In particular, because they depend from claims 1 and 23 respectively, claims 5 and 24 are allowable over *Humphries* in view of *Waldo* in further view of *Quirt*. *Quirt*, by itself and in combination with *Humphries* and *Waldo*, fails to teach or suggest a soft state store. The rejections of claims 1, 2, 4-6, 7, 9, 10, 15-18, 21, and 23-28 should therefore be withdrawn.

Applicants note with appreciation the allowance of dependent claims 3, 8, 11-14, 19, 20 and 22 if rewritten in independent form, including all limitations of the base claim as well as intervening claims. However, because the claims from which these claims depend are not obvious over *Humphries* in view of *Waldo*, for the reasons given above, it is respectfully submitted that the objections to these dependent claims should be withdrawn.

CONCLUSION

The application is considered to be in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue.

If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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